Remarks: See §2.2.1, pages 19 till 21
See §2.3, pages 24 till 26
See §2.6, pages 34 onwards

Answers:

a. $\dfrac{\Delta\ell^{(\mathrm{BD})}}{\Delta\ell^{(\mathrm{CE})}} = 2$

b. $\dfrac{\Delta\ell^{(\mathrm{BD})}}{\Delta\ell^{(\mathrm{CE})}} = 1$

Explanation:

a. $\varepsilon = \dfrac{\sigma}{E} = \text{constant} \rightarrow \dfrac{\Delta\ell^{(\mathrm{BD})}}{\Delta\ell^{(\mathrm{CE})}} = \dfrac{\varepsilon\ell^{(\mathrm{BD})}}{\varepsilon\ell^{(\mathrm{CE})}} = \dfrac{\ell^{(\mathrm{BD})}}{\ell^{(\mathrm{CE})}} = 2$

b. The weight of the triangular plate is supported by the steel wires.

$N^{(\mathrm{CE})} = \frac{2}{3}G\,; \quad N^{(\mathrm{BD})} = \frac{1}{3}G$

$\dfrac{\Delta\ell^{(\mathrm{BD})}}{\Delta\ell^{(\mathrm{CE})}} = \dfrac{N^{(\mathrm{BD})}\ell^{(\mathrm{BD})}}{N^{(\mathrm{CE})}\ell^{(\mathrm{CE})}} = 1$